PATENT APPLICATION OF

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FOR

STRUCTURAL THERMAL FRAMING AND PANEL SYSTEM FOR ASSEMBLING FINISHED OR UNFINISHED WALLS WITH MULTIPLE PANEL COMBINATIONS FOR POURED AND NONPOURED WALLS

Background – Field of Invention

This invention relates in general to a building system for residential and commercial buildings. Specifically, to permanent, thermal panel forms for poured and nonpoured walls in combination with high strength thermally efficient structural framing members or studs.

Background – Description of Prior Art

Prior art, traditionally concrete walls are built by erecting wooden or metal forms into which concrete is poured. These forms are structurally rigid and, when properly secured, produce a straight wall. Once the concrete has hardened, the forms are removed and either discarded or moved to the next construction site. Concrete, however, does not provide the most efficient thermal barrier, nor does it provide a suitable surface for attaching interior sheet rock and wall boards or exterior siding and facades. Erection and removal of these large heavy forms is a labor intensive procedure and transportation costs for moving the forms from one construction site to another is expensive. Most prior art building structures use large amounts of concrete and have elaborate engineered steel frames. Whereas, my invention uses minimal amounts of concrete in combination with other building materials and the steel frame having the ability to be adjusted to accommodate different wall widths and is used for the permanent support for the structural thermal framing and panel system.

Another type is an insulated, poured concrete wall having internal and external insulation, drywall or other surface preparation connecting areas which are continuous of and extending the entire or selected lengths of the wall and apparatus for the provision of windows into the wall. This is elaborate and more expensive than my invention. Whereas, my invention has fewer parts to assemble making it more cost effective.

Another type is a method for constructing a wall of a building includes the steps of providing a footing form to outline a horizontal dimension for the wall. Having a wall form ring material between opposing sides of the footing form and allowing the poured wall forming material to set to provide a wall base. Having a first wall and a second wall being opposite to the first wall forming an upright structure forming a wall. This system is more elaborate and more expensive than my invention. This prior art system lacks the ability to adjust to a multi-width whereas, my invention has the ability to adjust making different width walls by adjusting the steel frame.

Another type is a building form system and apparatus including T-shaped and U-shaped lengths of extruded plastic or steel coupled at their sides by rigid links. The links are preferably coupled at ninety degree angles along the lengths of the T-shaped and U-shaped elongated members. This system has more assembled parts than my invention making it more costly and it takes more assembly time.

Another type is a concrete form system having plurality of foam panels which are interlocked transversely, horizontally and vertically by a plurality of connectors. This system is very expensive in comparison to my invention.

Another type is a prefabricated wall forming structure for constructing reinforced concrete wall employs insulating foam plastic panels that are interlocked into two parallel concrete impervious walls by I-beam channels that are spaced apart by tie elements. The tie elements can support horizontal or vertical reinforcing bars and prevent the foam wall from spreading apart under the hydraulic pressure of the poured concrete. This system has more parts to assemble than my invention making more costly assembly and this

system lacks the ability to be adjustable. My invention has an adjustable frame giving it the ability to adjust to different widths.

Another type is a modular wall construction system includes a box-like block form of expanded foam plastic material such as polystyrene having opposite, parallel, spaced apart side walls and end walls extending between upper and lower surfaces and defining an internal cavity for receiving concrete slurry. This system takes more concrete to form the internal wall making it more expensive and less versatile than my invention.

Another type is a concrete structure made from precast concrete structures. Having an outer wall and an inner wall forming an inter-region between the walls allowing reinforcing concrete to be added. This is an elaborate system which is more costly than my invention.

Another type is a wall form assembly having a pair of form wall assemblies which are kept in preselected spaced parallel relationship by means of cross members fitted within end slots and interlocked by means of pins with elongated braces mounted for movement from a low profile position for transport to a high profile operative position in which the width

dimension is transverse to the plane of the form wall for maximum resistance to bowing from the hydrostatic pressure of wet concrete. This is a system for forming a wall than a wall itself. Whereas, my invention is a wall system which becomes the wall itself and has a framing stud which has the ability to adjust for different widths of wall. My invention has very small amounts of concrete needed in combination with different types of building materials.

Another type is a building component comprising first and second high density foam panels each having inner and outer surfaces, top and bottom, and first and second ends, the panels arranged in spaced parallel relationship with their inner surfaces facing each other, and at least two bridging members extending between and through and molded into the panel members, each bridging members comprising a pair of elongated end plates oriented in the top to bottom direction of the panels and abutting against the outer surfaces of the panels, and at least one web member extending between and rigidly connected to the end plates, each web member oriented in the top to bottom direction of the panels and having a height substantially less than

the height of the panels. This system requires a large amount of concrete to construct the interior part of wall whereas, my invention takes less concrete in forming the interior part of the wall and my invention has the ability to be adjusted to different widths since the reinforcement frame has an adjustment feature allowing it to be of different widths.

Another type is a multi-component modular system for use in fabricating wall structures of the type which may be fortified with concrete or other similar materials. This system has no adjustable feature for different widths where, my invention does. My invention has a support frame which can be adjusted to different widths, therefore, one framing stud can be adjusted to multi-width wall thickness, thereby, having a multi use.

Another type is a masonry structure reinforcing and confinement apparatus is disclosed for enhancing the structural integrity under stress of masonry structures formed of a plurality of stacked masonry units. This system is for a masonry system only. My invention is for a wall forming system, therefore, my invention is not a masonry system.

Another type is a construction block to be used with other similar blocks in order to construct panels of a building which is formed of a pair of substantially planar panels located in juxtaposition and spaced apart forming a space between the panel. This system is a block system whereas, my invention is a panel system.

Another type is an insulating form work for casting a concrete wall, the form work having a pair of side walls, each of which is made up of a plurality of coplanar edge-abutting modular panels made of insulating foam material. Each panel has upper and lower edges with coplanar slits provided there along, and a pair of vertical end edges respectively provided with a tongue-and-groove to form vertical tongue-and-groove joints with other like adjoining panels. This system has a first group of angle-irons having vertical branches fitting into the upward slits of the panels and horizontal branches pierced with holes extending toward the panel inner face. The panels are also interconnected by a second group of angle-irons having vertical branches fitting into the downward slits of the panels and horizontal branches also pierced with holes extending toward the panel inner face and overlapping the

horizontal branches of the angle-irons of the first group. The holes register together and the tie-rods hold the side walls together. The tie-rods have a central portion between the side walls and bent end portions extending through the panels. Elbows between the portions fit into the rabbets. This system does not have the ability to be adjusted to various widths whereas, my invention has this ability making it more versatile, also, less labor intense.

Another type is a modular synthetic plastic concrete form structure for forming a concrete wall or free form or an enclosure having a curved corner. The side panels are positioned in spaced opposed relation. Ties connect the panels in transversely spaced relation and with the panels and the ties being permanently attached with the concrete poured between the panels as a reinforcing and heat insulator. This system has ties that are not able to be adjusted to various widths by using the same framing stud for all different wall thickness, which makes my invention more unique.

Another type is a prefabricated module comprising a three-dimensional armature formed by welded wires and flat elements from light

and/or heat-insulating material, retained on either side of the armature to form at least one continuous panel. This system is very complex because of all the welded wires going vertical and horizontal. Because of the complex wire system involved, it's very labor intense making it costly to assemble whereas, my invention is more simplistic making it less labor intense and less costly. Also, my invention, having the adjustable feature that the same framing stud can be used for different width walls, makes my invention novel.

Another type is it has vertical members set in a common base each having spaced pairs of flanges with vertical recess between the flanges of each pair receiving and retaining fastening means by which plasterboard sheets are secured, in spaced relation to the vertical members and defining a molding cavity between metal foil on the facing surfaces of the sheets a core of no-fines concrete being set in said cavity. This system has no adjustable framing studs that can be adjusted to various widths for wall width whereas, my invention has a framing stud that has the ability to be adjusted so the

same framing stud can be used for various width walls, which makes my invention unique.

Another type is a wall unit assembly having a steel skeleton frame which cannot be adjusted but is rigid whereas, my invention is adjustable so the same framing stud can be used for various width walls, which makes my invention unique because of the adjustable feature.

Objects and Advantages

Accordingly, besides the objects and advantages described above, several objects and advantages of the present invention are:

(a) to provide for an improved thermal-efficient, cost effective permanent wall framing and wall forming system.

(b) to provide for an improved wall forming system which holds the building panels in a desired position so the resultant wall is straight.

(c) to provide a permanent frame stud producing a finished wall which has much greater structural integrity than previous wall forming systems.

(d) to allow pluralities of forms or building panels define a space

for receiving filler.

(e) to provide a framing stud that will resist bending in the wall.

(f) to provide a framing stud which is the substantial structural component in a filled or unfilled finished wall.

(g) to provide a permanent framing stud that allows the erection of a solid single panel form for pouring just a concrete header and poured corners, or panels that form a post and beam matrix concrete structure.

(h) to provide a panel with no defined spaces for receiving filler and is solely a steel framed wall.

(i) to provide for a specially designed and engineered framing stud which has a rigid center webbing and rigid outer flanges, this combination forms a structural stud with truss type strength.

(j) to provide when this structural stud is used in combination with concrete the structural properties of the stud is further improved.

(k) to allow the concrete to form around the structural webbing thereby becoming a part of the webbing. This webbing is connected to a rigid inner and outer cord or flange that is offset from the outer edge of the

concrete, thus moving the compression and tension zone out from the center axis point.

(l) to allow the structural formed stud in combination with a thin concrete wall to be comparable in overall strength to a much thicker concrete wall.

(m) to provide for better seismic properties for the overall wall.

(n) to allow all panels or panel forms in this system to be prefinished on the exterior facings prior to delivery.

(o) to provide improved shear strength of the panel.

(p) to provide a keyed grooving process that allows the user the ability to easily modify the panel by sliding filler pieces in between two panel forms thereby allowing the panel the ability to form walls in various thickness and the ability to pour filler in defined areas within the panel to form posts and beams or to form openings in the poured wall for windows and doors.

(q) to provide multiple flange receptacle grooving or slots on both ends of the panel allowing for even more pour combinations and the ability to form various thickness of walls with one combination panel.

(r) to provide a framing stud with an adjustable feature allowing the frame support to adjust to various widths thereby one framing stud will fit various walls having different width thickness.

(s) to provide bend out stud brackets that are part of the framing for holding horizontal and/or vertical rebar in a desired configuration, thereby these brackets add structural strength to the webbing of the stud frame.

(t) to provide bend out brackets which are part of the framing stud for fastening to footings or other substrates without the use of "L", "C", or "U" channels.

It is an object of the present invention to provide an improved structural thermal framing panel system for assembling finished or unfinished walls with multiple panel combination for poured and nonpoured walls.

Other objects and features are readily apparent from the following description of certain preferred embodiments thereof taken in conjunction with the accompanying drawings although variations and modifications may be affected without departing from the sphere and the scope of the normal concepts of the disclosed invention. You will find further objects and advantages of the invention from a consideration of the ensuing descriptions and accompanying drawings.

Drawing Figures

Fig 1 Shows a perspective break-out view of the thermal steel framing stud and insulated panel assembly.

Fig 2 Shows a perspective break-out view of the steel framing stud and insulated concrete panel assembly.

Fig 3 Shows a perspective view of the framing stud.

Fig 4 Shows a blow-up view of the framing stud first and second ends with adjustable means.

Fig 5 Shows a top view of a straight insulated panel.

Fig 6 Shows a perspective view of a straight insulated panel.

Fig 7 Shows a top view of an outside 90 degree corner insulated panel.

Fig 8 Shows a perspective view of an outside 90 degree corner insulated panel.

Fig 9 Shows a top view of an inside 90 degree corner insulated panel.

Fig 10 Shows a perspective view of an inside 90 degree corner insulated panel.

Fig 11 Shows a top view of an inside 45 degree corner insulated panel.

Fig 12 Shows a perspective view of an inside 45 degree corner insulated panel.

Fig 13 Shows a top view of an outside 45 degree corner insulated panel.

Fig 14 Shows a perspective view of an outside 45 degree corner insulated panel.

Fig 15 Shows a perspective view of a straight insulated panel.

Fig 16 Shows a perspective blow-up view top ⌐ and ⌐ shaped headers.

Fig 17 Shows a perspective view of a slotted angle.

Fig 18 Shows a perspective view of a ⅂ shaped header.

Fig 19 Shows a perspective view of a ⅃ shaped header.

Fig 20 Shows a top view of the thermal steel framing stud and insulated panel assembly.

Fig 21 Shows a top view of the steel framing stud and insulated concrete panel assembly.

Fig 22 Shows a top view of a straight insulated concrete panel.

Fig 23 Shows a perspective view of a straight insulated concrete panel.

Fig 24 Shows a top view of a 45 degree corner insulated concrete panel.

Fig 25 Shows a perspective view of a 45 degree corner insulated concrete panel.

Fig 26 Shows a top view of a 90 degree corner insulation concrete panel.

Fig 27 Shows a perspective view of a 90 degree corner insulated concrete panel.

Drawing Reference Numerals:

29 The structural thermal framing and panel system for assembling finished or unfinished walls with multiple combinations for poured and nonpoured walls

30 framing stud assembly

31 first end

32 second end

33 web first end

34 web second end

35 flange first end

36 flange second end

37 slotted interlock receiver hole second end

38 interlock tab first end

39 top tab first end

40 top tab second end

41 bottom tab first end

42 bottom tab second end

43 rebar holder second end

44 electric utility hole first end

45 electric utility hole second end

46 straight insulated panel

47 top groove for header

48 groove for electric utility conduit

49 slot for framing stud flange

50 inset area for framing stud flange

51 outside 90 degree corner insulated panel

52 inside 90 degree corner insulated panel

53 inside 45 degree corner insulated panel

54 outside 45 degree corner insulated panel

55 top ㄱ shaped header

56 top ㄱ shaped header

57 ㄴ shaped slotted connector angle

58 slotted receiver hole for top tab

59 straight thin insulated panel

60 45 degree long corner thin insulated panel

61 45 degree short corner thin insulated panel

62 90 degree long corner thin insulated panel

63 90 degree short corner thin insulated panel

64 concrete filler

65 horizontal rebar

Description of Invention

The structural thermal framing and panel system for assembling finished or unfinished walls with multiple combination for pour and non poured wall 29, shown in Fig 1, Fig 2, Fig 3, Fig 4, Fig 5, Fig 6, Fig 7, Fig 8, Fig 9, Fig 10, Fig 11, Fig 12, Fig 13, Fig 14, Fig 15, Fig 16, Fig 17, Fig 18, Fig 19, Fig 20, Fig 21, Fig 22, Fig 23, Fig 24, Fig 25, Fig 26, and Fig 27 comprises at least one framing stud assembly 30, Fig 3 and Fig 4, having one first end 31, Fig 3 and Fig 4, having sufficient thickness, width and length, having one web 33, Fig 3 and Fig 4, having sufficient thickness, width and length, one flange 35, Fig 4, having sufficient thickness, width and length, at least one interlock tab 38, Fig 4, having sufficient thickness, width and length, one top tab 39, Fig 3, having sufficient thickness, width

and length, one bottom tab 41, Fig 3, having sufficient thickness, width and length, at least one electric utility hole 44, Fig 4, having sufficient area to accommodate electric conduit. One second end 32, Fig 3 and Fig 4, having sufficient thickness, width and length, having one web 34, Fig 3 and Fig 4, having sufficient thickness, width and length, one flange 36, Fig 4, having sufficient thickness, width and length, at least one slotted interlock receiver hole 37, Fig 4, having sufficient area to accommodate interlock tab 38, Fig 4, located on said first end 31, Fig 3 and Fig 4, one top tab 40, Fig 3, having sufficient thickness, width and length, one bottom tab 42, Fig 3, having sufficient thickness, width and length, at least one rebar holder 43, Fig 4, having sufficient thickness, width and length and having sufficient area to accommodate required horizontal rebar, at least one electric utility hole 45, Fig 4, having sufficient area to accommodate electric conduit, Fig 1, shows a structural thermal framing and panel system with multiple panel combinations for nonpoured wall comprising of at least one said framing stud assembly 30, Fig 3, at least one straight insulated panel 46, Fig 5 and Fig 6, having sufficient thickness, width and length, at least one outside 90

degree corner insulated panel 51, Fig 7 and Fig 8, having sufficient thickness, width and length and/or at least one inside 90 degree corner insulated panel 52, Fig 9 and Fig 10, having sufficient thickness, width and length and/or having at least one inside 45 degree corner insulated panel 53, Fig 11 and Fig 12, having sufficient thickness, width and length, and/or having at least one outside 45 degree corner insulated panel 54, Fig 13 and Fig 14, having sufficient thickness, width and length all said panels having one top groove 47, Fig 5, Fig 6, Fig 7, Fig 8, Fig 9, Fig 10, Fig 11, Fig 12, Fig 13 and Fig 14, having sufficient area to accommodate ⊤ shaped header 55, Fig 18, having sufficient thickness, width and length and ⊥ shaped header 56, Fig 19, having sufficient thickness, width and length, at least one ⌊ shaped slotted connector angle 57, Fig 17, having sufficient thickness, width and length and having multiple slotted received hole 58, Fig 17, to accommodate top tab 39, Fig 3, and top tab 40, Fig 3, said panels having groove 48 having sufficient area to accommodate electric utility conduit, having slot 49 having sufficient area to accommodate said framing stud flange, having two inset area 50 having sufficient area to accommodate same

framing stud flange. Said groove 48, slot 49, inset 50 are shown in Fig 5, Fig 6, Fig 7, Fig 8, Fig 9, Fig 10, Fig 11, Fig 12, Fig 13 and Fig 14.

Fig 2 shows a structural thermal framing and panel system with multiple panel combinations for poured wall comprising of at least one said framing stud assembly 30, Fig 3, at least two straight thin insulated panel 59, Fig 22 and Fig 23, having sufficient thickness, width and length, at least one 45 degree long corner thin insulated panel 60, Fig 24 and Fig 25, having sufficient thickness, width and length and/or at least one 45 degree short corner thin insulated panel 61, Fig 24 and Fig 25, having sufficient thickness, width and length, and/or at least one 90 degree long corner thin insulated panel 62, Fig 26 and Fig 27, having sufficient thickness, width and length, and/or having at least one 90 degree short corner thin insulated panel 63, Fig 26 and Fig 27, having sufficient thickness, width and length. Said panels 59, 60, 61, 62, 63 having concrete filler 64, Fig 22, Fig 23, Fig 24, Fig 25, Fig 26 and Fig 27, having sufficient thickness, width and length between said panels. The structural thermal framing and panel system for assembling finished or unfinished walls with multiple panel combinations

for poured and nonpoured walls 29 make up components may be made from concrete, stone, brick, foam, plastic, wood, iron, steel, aluminum or any other type metal, polyurethane type composite with fiber glass, high density expanded polystyrene, plastic or any combination of these materials.

Conclusion and Scope of Invention

Accordingly, the reader will see that the structural thermal framing and panel system for assembling finished or unfinished walls with multiple panel combinations for poured and nonpoured walls of this invention has the ability to be installed in a fraction of the time compared to masonry or solid concrete walls with about the same or less in total material costs. Furthermore, the structural thermal framing and panel system has the additional advantages in that:

- it provides an improved thermal-efficient, cost effective permanent wall framing and wall forming system which holds the building panels in a desired position so the resultant wall in straight.
- it provides a finished wall which has much greater structural

integrity than previous wall forming systems.

- it provides for a permanent stud frame with a plurality of forms or building panels with a defined space for receiving filler, and wherein the framing stud substantially conforms to a portion of the forms or building panels and resists bending in the wall.
- it allows the framing stud web to become part of a rigid inner and outer cord or flange that is offset from the outer edge of the concrete, thus moving the compression and tension zone out from the center axis point.
- it provides comparable in overall strength to a much thicker concrete wall and also has better seismic properties.
- it allows all panels or panel forms in this system to be prefinished on the exterior facings prior to delivery.
- it allows the framing stud assembly to adjust to different wall thickness, so that the same framing stud assembly has multiple use.
- it provides a wall forming system to utilize the structural

strength of the framing stud assembly in reducing the amount of concrete and rebar needed to form a structurally sound wall.

- it allows a plurality of permanent panel forms in combinations with or without concrete.
- it provides bottom bend out tabs for holding the framing stud assembly to the footing or floor.
- it provides top bend out tabs for holding the framing stud assembly to the adjoining form panels.
- it allows panels to be precoated with cementitious fiber or wire type reinforced hard coat finish for exterior facing of the forms that can be taped or meshed at the seams and a finished coat.
- it allows the ability to fasten the framing stud assembly to footings or other substrates without the use of "L", "C", or "U" channel usually required by prior art.

Although the description above contains many specifications, these should not be construed as limiting the scope of the invention but merely

providing illustrations of some of the presently preferred embodiments of this invention.

Thus, the scope of the invention should be determined by the appended claims and their legal equivalents, rather than by the examples given.